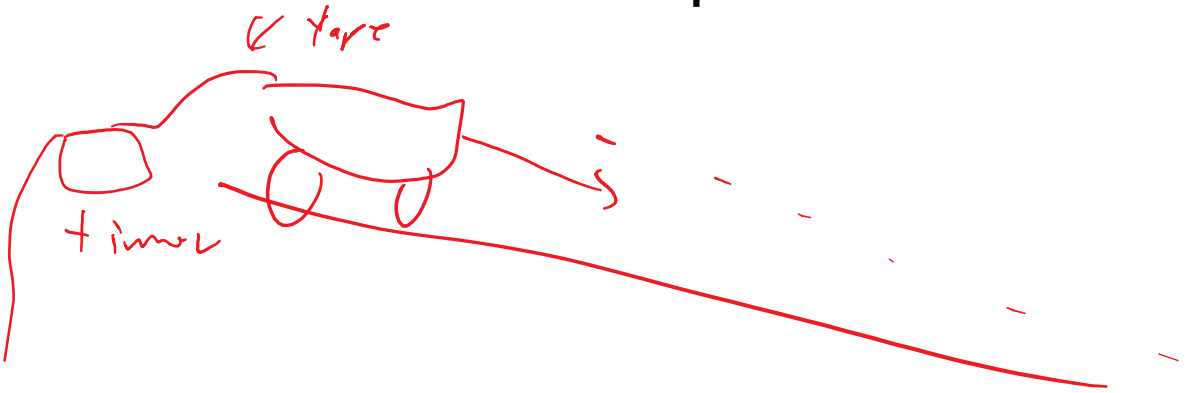
acceleration

quiz acceleration oct 18
test everything Oct 25

p69
CR 1.3
km/h/s = km/h x 1/s km/h(1h/3600s) (1000m/1km) x 1/s = 0.277m/s^2
km/s/h= km/s x 1/h (h/3600s) (1000m/1km) = 0.277 m/s^2
1.4
distance and time between frames
d/t = average velocity in each time frame
compare averages you can estimate the acceleration.

Next class: ticker tape lab



formal lab
prelab: read p22 on the online lab manual
http://physics-pages.wikispaces.com/file/view/LAB%2BMANUAL%2BPhysics%2B11.pdf/549025990/LAB%2BMANUAL%2BPhysics%2B11.pdf
copy out the purpose
create your own hypothesis for each purpose (4)
procedure: write "refer to lab manual p22"
by hand
observations
d-t and v-t data tables - note v-t table starts at 0.05s. Why? when data points for d-t table are 0, 0.1 s 0.2s...

if a is uniform then:
a=(v-u)/t slope of the v-t graph
area under the v-t graph
s=1/2(u+v)t
variables: a, v, u, s, t
if you have a, v, u, t - use the first equation
if you have s, u , v, t - use the second equation
derive equations relating

a) v, u , s, a - get rid of t
 isolate and sub
b) s, a, t, u - get rid of v

10 minutes to derive
then solve:
Freddy is driving at a constant acceleration towards Church's Chicken at 8.0 m/s^2 , if he starts at 5.0 m/s and ends at 20.0m/s how far has he gone?
Freddy is now stopped at a light, and then accelerates at 8.0 m/s^2 for 5.0 s. How far has he gone?

$a=(v-u)/t \quad t=(v-u)/a$
$s=1/2(u+v)t = 1/2(u+v)(v-u)/a$

$2as = (u+v)(v-u) = v^2 + uv - vu - u^2$
$2as = v^2 - u^2$

$v^2 = u^2 + 2as$

$s = (v^2 - u^2)/2a = (20^2-5^2)/2(8)$
$s = 375\ m^2/s^2/2(8 m/s^2) = 375/16=23.4375$
$s = 23\ m$

$s=1/2(u+v)t$ $a=(v-u)/t$ $v= at + u$

$s=1/2(u+ at + u)t$

$s=1/2(2u +at)t$

$s= ut + 1/2\ at^2$

$s= 0 + 1/2\ (8.0 m/s^2)(5.0s)^2$

$s = 100\ m = 1.0 \times 10^2\ m$ (2 sig figs)

problems 13-24 p 72-75